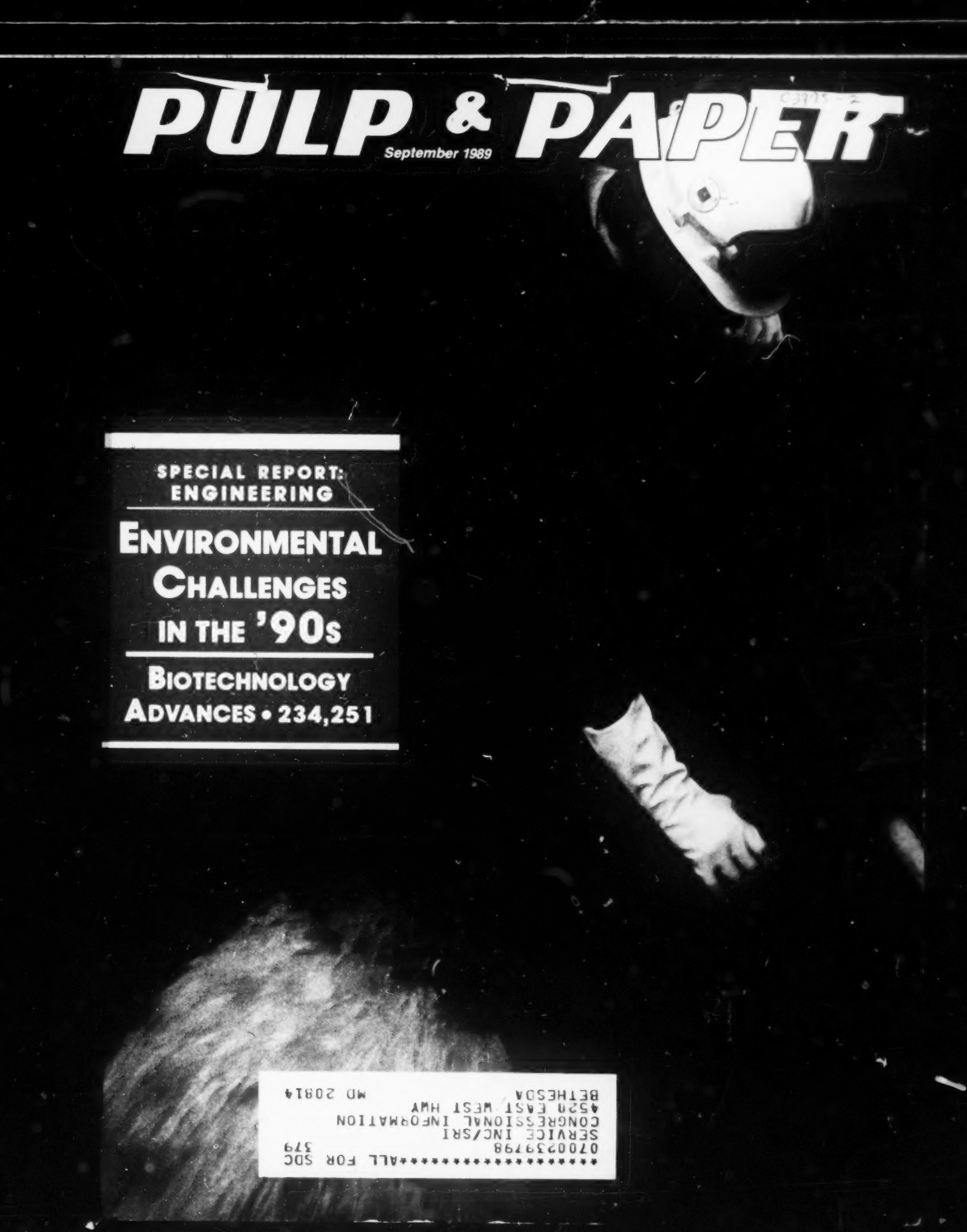
PULP & PAPER

September 1989



SPECIAL REPORT:
ENGINEERING

ENVIRONMENTAL CHALLENGES IN THE '90s

BIOTECHNOLOGY ADVANCES • 234,251

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Number 9

SEPTEMBER

SPECIAL REPORT
ENGINEERING

ENVIRONMENTAL CHALLENGES IN THE '90s

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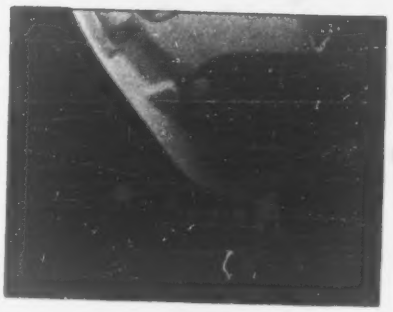
This issue's 20-article special report on environmental engineering in the paper industry looks closely at new technology now being implemented at U.S. and Canadian paper mills as public concern over the environment grows and government regulations tighten. **(Photo by Jay Storr, Houston, Texas.)**



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ABP

BPA

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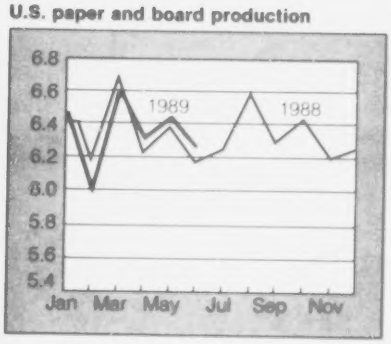
U.S. paper and board production



U.S. production of paper and paperboard totaled 6.2 million tons in June, down 1.1% from the same month last year, according to the American Paper Institute. Due to sluggishness in the general economy, production for the first half was off 0.5%, after seasonal adjustments, to an annual rate of 76.3 million tpy. The paper sector was responsible for the decline, falling 1.6% through June, while paperboard posted a 0.6% gain.

Among major grades, coated paper continued to suffer from lower shipments to magazine and book publishers. Uncoated free-sheet markets for office reprographics were strong but not strong enough to offset weaker markets for commercial printing paper and business forms. Production of containerboard for domestic use was up 0.8% through June, supported by strong demand from box makers. Shipments of fiber boxes were up 1.8% through the first half.

Canadian newsprint shipments totaled 821,000 metric tons in June, down 3.5% from June 1988, bringing first-half shipments down 2.3% from last year. Operating rates slipped from 99% in first-half 1988 to 96% this year. Pulp shipments were off 1.1% in the first half, with mills operating at 93%. ■

	Latest month (000 short tons)		% change from year ago	Annualized year-to-date (000 short tons)	% change from year ago
PAPER & PAPERBOARD PRODUCTION[1]					
Newsprint	June	498	1.6	5,931	-0.8
Uncoated groundwood (s)	June	132	10.0	1,705	8.0
Coated paper (s)	June	554	-10.2	6,922	-6.6
Uncoated free-sheet (s)	June	853	-9.0	11,105	-1.8
Other printing/writing	June	123	0.0	1,516	0.5
Total packaging and other paper (s)	June	401	-5.2	4,869	-4.3
Tissue	June	466	2.6	5,592	2.6
Total paper	**June**	**3,026**	**-4.4**	**37,640**	**-1.9**
Unbleached kraft paperboard	June	1,644	3.8	19,488	0.7
Semichemical medium	June	468	0.4	5,692	1.6
Bleached paperboard	June	393	7.4	4,486	-0.5
Recycled paperboard	June	717	-2.7	8,750	-2.7
Total paperboard	**June**	**3,222**	**2.2**	**38,416**	**0.3**
Total U.S. paper and paperboard output	**June**	**6,247**	**-1.1**	**76,056**	**-0.8**
PULP, WASTEPAPER & [illegible][2]					
Total U.S. woodpulp production	May	5,087	1.7	62,097	1.9
Market pulp production	May	720	9.9	8,817	4.8
Wastepaper consumption at paper/board mills	May	1,624	0.8	18,895	0.0
Pulpwood consumption (cords)	May	8,112	6.0	97,238	1.3
CORRUGATED PRODUCTS STATISTICS[3]					
Corrugated box shipments (billion ft²)	June	26.391	1.8	157.055[6]	1.8
Containerboard inventories at U.S. box plants and mills	June 1	2,495	-3.9		
INTERNATIONAL TRADE[4]					
U.S. paper imports (including products)	May	1,147	4.7	12,913	0.1
Imports of Canadian newsprint	May	723	-2.4	8,053[6]	-6.7
U.S. paper exports (including products)	May	591	30.8	6,356	13.9
Exports of unbleached kraft linerboard	May	232	45.0	2,367	8.7
Exports of woodpulp	May	504	16.4	6,277	18.3
Norscan pulp inventories[4]	June 30	773	15.4		
Norscan pulp operating rates[4]	June	97%	95%	96%	98%
CANADIAN STATISTICS[5] (reported in metric tons)					
Total newsprint shipments	June	821	-3.5	4,764[6]	-2.3
Operating rates	June	95%	97%	96%	99%
Inventories held by U.S. consumers	June 30	1,302	-15.7		
Other paper/board shipments	June	546	-4.0	3,319	-1.5
Woodpulp shipments (export only)	June	696	-0.7	3,972	-1.1
Operating rates	June	92%	98%	93%	95%

1. American Paper Institute. 2. API, Bureau of Census, American Pulpwood Assn. 3. Fibre Box Assn., Paperboard Packaging Council. 4. North American/Scandinavian paper-grade market pulp. 5. Canadian Pulp & Paper Assn. 6. Not annualized. (s) = Shipments.

Uncoated groundwood: Weaker newsprint affecting lower-end groundwood grades

Grade structure: Uncoated groundwood paper is a higher-value relative of newsprint. Physical properties of groundwood grades compared with newsprint include higher brightness and smoother surfaces. Gloss is added through supercalendering, allowing these grades to compete with lightweight coated (LWC) groundwood paper. Brightness levels range from 64 to 74 Elrepho, compared with 56 to 62 for standard newsprint. Basis weights range from 20 to 45 lb/3,300 ft². Primary uses include preprinted newspaper inserts and direct-mail flyers, catalogs, lower-cost business forms, Sunday newspaper magazines, and telephone directories.

Production/capacity: North American production of groundwood paper has continued to grow in the past few years, mostly in supercalendered (SC) and directory grades. Conversion of newsprint machines to make groundwood specialties has continued, and pressure from newsprint overcapacity may prompt more such conversions. Shipments by U.S. mills increased 116,000 tons in 1988 from 1987, a 7.8% increase. That tonnage primarily came from the new SC machine at Lake Superior Paper Industries Inc., Duluth, Minn. Canadian shipments, of which 78% are sent to the U.S., rose 10.2% to 1.489 million metric tons in 1988. Shipments to the U.S. were up 9.8%.

North American capacity is continuing to rise. Canadian uncoated groundwood capacity increased 9.9% in 1988 to 1.495 million metric tpy. Another 14.3% increase is expected this year, and capacity will advance by 33.6% for the 1988 to 1991 period. U.S. mills increased their capacity 2.6% in 1988 to 1.696 million short tpy, and this figure will rise 3.9% in 1989, leading to a 1988-91 growth of 10.6%, or 1.875 million tpy.

The following are some recent and future projects: St. Marys Paper Inc., Sault Ste. Marie, Ont. (131,000 short tpy, 1988); Lake Superior Paper Industries (245,000 short tpy); Consolidated-Bathurst Inc., Grand'Mère, Que. (110,000 short tpy net, 1989); and F.F. Soucy Inc., Rivière-du-Loup, Que. (22,000 short tpy, rebuild, 1989). Daishowa America Co. Ltd. has proposed a new 150,000-tpy directory paper machine in Port Angeles, Wash.; Lake Superior is studying a second 220,000-tpy machine; Cascade Inc. may build a 210,000-short-tpy machine at Port Cartier, Que.; and Madison Paper Industries may move ahead with a 170,000-tpy expansion of SC paper at its Madison, Maine, mill. Total capacity would then be 400,000 tpy.

Outlook: Fairly stable demand growth rates of 4.1%/year are expected for the next decade. Demand from the various end uses will stay relatively healthy in the next ten years. Growth for directories should average about 2.4% annually through 1993. Directory growth is being revised downward because of consolidation in the industry, particularly in the yellow pages area.

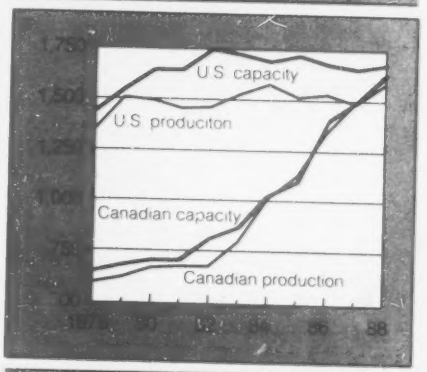
SC paper will account for about 84% of the catalog paper market by 1998. Consumption of groundwood paper for catalogs may rise about 0.15%/year through 1993. Paper for business forms will advance by about 7.5%/year through 1993.

Groundwood consumption for preprinted advertising inserts is expected to grow almost 6.5% annually, while other forms of commercial printing may consume 3.5% more paper each year. Magazine publishers and printers are likely to use about 2.8%/year more uncoated groundwood paper. Uncoated groundwood paper for books is likely to drop 0.9% annually through 1993.

Prices: Prices on all grades rose from late 1986 through 1988, but a somewhat weakening market has cut off any near-future increases. The most likely to rise again is SC if LWC rises first. Most grades were being discounted from list by mid-1989.

Year-end list prices for 34-lb supercalendered ($/short ton): 1986, $735; 1987, $704; 1988, $830; mid-year 1989, $830. Prices for 35-lb offset, 65 brightness: 1986, $537; 1987, $565; 1988, $675; mid-year 1989, $675. For standard 30-lb rotonews: 1986, $493; 1987, $541; 1988, $650; mid-year 1989, $650. For 15-lb 65 brightness forms: 1986, $520; 1987, $560; 1988, $720; mid-year 1989, $720. (See *P&P FactBook* for more detailed information.)

(000 tons)



U.S.	1987	1988	1989e
Production[1]	1,485	1,598	1,684
Capacity[1]	1,653	1,696	1,762
Utilization rate	89.8	94.2	95.6
Imports	1,270	1,404	1,470
Exports	56	66	71
Apparent U.S. consumption	2,699	2,936	3,083
lb/capita	22.13	23.86	24.83
GNP ratio[2]	1.40	1.46	1.51
Canada			
Production[3]	1,498	1,641	1,822
Capacity[3]	1,499	1,648	1,884
Utilization rate	99.9	99.6	96.7
Exports	1,256	1,328	1,474

e = *P&P* Estimate.
1. American Paper Institute shipments. **2.** 000 tons/billion $ real GNP. **3.** Canadian Pulp & Paper Assn.

(000 short tons)

	Annual capacity	Market share (%)
1. Abitibi-Price[1]	525	12.1
2. MacMillan Bloedel	444	10.2
3. Canadian Pacific	430	9.9
4. ConBath[2]	423	9.7
5. GN Nekoosa	288	6.6
6. Boise Cascade[3]	270	6.2
7. Lake Superior[4]	240	5.5
8. Champion	239	5.5
9. Domtar	190	4.4
10. Madison	175	4.0

Market share of top five companies: **48.6%**
Market share of top ten companies: **74.2%**
North American capacity (1989): **4.346e**
U.S.: **1.762** Canada: **2.584[5] million short tons**

e = *P&P* estimate.
1. Some sources indicate 475,000 short tpy. **2.** Subsidiary of Stone Container Corp. **3.** Fort Frances, Ont. **4.** 50% owned by Pentair Inc. **5.** Canadian Pulp & Paper Assn. estimates 1989 capacity at 1.884 million short tons (does not include uncoated groundwoods classified as newsprint for trade purposes).
Note: Capacity figures provided by companies.

MARKET PULP

P&W to build 1,250-tpd pulp mill in Alabama

Parsons & Whittemore Inc. said that it will spend $700 million on construction of a 1,250-metric-tpd bleached softwood kraft market pulp mill located near Alabama River Pulp Co.'s 425,000-metric-tpy bleached market pulp mill in Claiborne, Ala. P&W said that when the construction of Alabama Pine Pulp Co. is completed in late 1991, total output from the Claiborne site—which also includes Alabama River Newsprint Co., a joint venture with Abitibi-Price Inc.—will amount to about 1.2 million metric tpy of pulp and paper.

With the startup of its new 650-tpd St. Anne-Nackawic hardwood mill in New Brunswick, P&W becomes the world's largest producer and seller of bleached kraft market pulp, the company said. (This would appear to give P&W total capacity of about 1.1 million tpy, which would be more than current market leader Weyerhaeuser Paper Co.'s kraft market pulp capacity, but the latter will be completing a new pulp mill in Columbus, Miss., in late 1990.) P&W sells its pulp through its Toronto, Ont.-based St. Anne Pulp Sales Co. subsidiary.

Alabama Pine will operate as a wholly owned subsidiary of P&W. P&W said the project represents the single largest industrial investment in Alabama's history. According to company reports, the new mill will use extended delignification and oxygen bleaching, and high chlorine dioxide substitution. Groundbreaking likely will occur in October. Construction of the new softwood pulp mill will permit the existing mill to run hardwood exclusively.

P&W said that the announcement of the Claiborne expansion does not preclude eventually moving forward with pulp mills elsewhere. As reported, P&W has taken an option on a piece of land at Apple Grove, W.Va., on the Ohio River. It also is looking at site in northwestern Alberta, near Fort Vermilion, on the Peace River. The site apparently has enough wood to support a 1,200-metric-tpd pulp mill. All of the expansion activity represents a dramatic turnaround for a company that was on the financial ropes only four years ago, after the last industry downturn.

• Eleven companies have demonstrated an interest in constructing a pulp mill somewhere near Columbia in southern Mississippi. A spokeswoman for the Columbia Chamber of Commerce said that no decision was imminent. ■

Paper-grade pulp capacity for top five producers by 1993 (000 a.d. metric tons).

Company	1988	1993	Grades
Parsons & Whittemore Inc.	515	1,075	SBHK, SBSK, NBHK
Aracruz Cellulose SA	380	1,025	Eucalyptus
Södra Skogsägarna AB	960	1,020	NBHK, NBSK
Georgia-Pacific Corp.	1,000	1,015	SBHK, NBHK, SBSK, sulfite
Weyerhaeuser Co.	880	995	NBSK, NBHK, SBSK

1. Total includes capacity at Celulose Guaiba and excludes 480,000 metric tons of fluff pulp capacity.
SBHK=Southern bleached hardwood kraft; NBHK=Northern bleached hardwood kraft; SBSK=Southern bleached softwood kraft; NBSK=Northern bleached softwood kraft.
Source: Parsons & Whittemore Inc.

James River to double Marathon's pulp output with $280-million expansion

James River Corp. said last month that its board of directors approved in principle plans for a US$280-million expansion at its James River-Marathon Ltd. subsidiary's bleached kraft pulp mill in Marathon, Ont. The project will lift softwood pulp capacity from 500 to 1,000 tpd when completed in late 1991. Construction is expected to begin this fall. Preliminary engineering studies were done by Sandwell Swan Wooster, Montreal, Que.

James River-Marathon is owned by James River (80%) and Buchanan Forest Products Ltd. (20%). The expansion will be paid for by the subsidiary. The project includes expansion of the existing recovery boiler, a new pulp dryer, and modifications to the pulp mill. The new pulp line will use oxygen delignification and alternate bleaching chemicals to reduce chlorine use to a minimum, the company said. It noted that dioxins are currently present in the effluent in minute quantities that are well within government standards.

The mill has a long-term timber cutting license on 1.6-million acres of timberland in northwestern Ontario, most of which is high-quality spruce and pine. Last month, the company acquired joint ownership of Dubreuil Forest Products Ltd., a lumber company located in Dubreuilville, Ont. This brought with it cutting rights to another 800,000 acres. The Marathon mill already uses woodchips from Dubreuil.

This project is part of James River's long-term strategy to balance its captive domestic pulp supply with its consumption. According to the company's 1989 annual report (fiscal year ended Apr. 30, 1989), James River bought 470,000 tons of market pulp during the year. It added about 70,000 tons of kraft pulp capacity during the period at a cost of $60 million and expects to add another 70,000 tons in 1990 at a cost of about $50 million. The Marathon expansion will close the gap by another 178,000 tpy and will consist of softwood, a grade for which the company currently has a large appetite but only a limited supply (mainly at Marathon). In addition to its domestic pulp deficit, James River also has developed about a 500,000-tpy gap in Europe due to its recent tissue acquisitions and joint ventures.

Part of the Marathon mill's output is sold on the market in North America and Europe. The company said it has not decided how much of the pulp from the new line will be sold outside. In addition to the bleached

Construction of the 100,000-tpy Nipawin, Sask., mill planned by Nortek Forest Products Ltd. was expected to begin in late July but has been pushed back until late summer or early fall, according to J. Phillip Piffer, president, Nortek. Piffer noted that the environmental review process was taking longer than expected, but startup of the mill is still scheduled for early to mid-1991.

• Asitka Resource Corp. said that plans for building a 250,000-metric-tpy thermomechanical pulp mill—possibly combined with a paper or paperboard machine of some type—in the Kalum region of northwestern British Columbia are taking longer to "coalesce" than previously expected. An announcement is now expected by early fall, with actual construction delayed until spring 1990, explained Hugh Cooper, president.

Plans may change somewhat from the original proposal based on three studies currently being reviewed, he noted. Details are not being released, but Cooper said that some type of paper or paperboard machine could be incorporated into the proposal. Two offshore joint-venture partners appear to be close to committing to the project. "Financing is definitely not a problem," Cooper said. ■

FINE PAPER

Boise commits to 318,000-tpy coated machine

Boise Cascade Corp. announced it plans to install a 318,000-tpy coated groundwood paper machine at its Rumford, Maine, publication paper mill. The $450-million project would bring the mill's capacity to 753,000 tpy, making Rumford one of the largest and lowest-cost coated paper mills in the world, said chairman and CEO John B. Fery.

Construction of the 325-in.-wide machine will depend on obtaining state and federal environmental permits. Exact timing of the project will also depend on market conditions, but work could begin in 1991 with startup of the machine in late 1993.

Installation of the machine would be the largest step taken in a project begun in 1988 to improve productivity and increase capacity. Other program components include constructing a cogeneration facility, enhancing two existing coated paper machines, and expanding the pulp mill. A complete rebuild of No. R-10 paper machine is still scheduled for spring 1990, according to company spokesman Eric Baxter.

The $52-million project is going to increase capacity by 20,000 tpy and will include a new Beloit headbox, a new top-wire former, a new four-nip press section, a smoothing press, and an infrared drying system. The machine will be down for 29 days next March during rebuild, which will enable it to produce Nos. 3 and 4 coated paper instead of No. 5. Rust International was named as the general contractor on this project.

Boise recently completed a $12-million rebuild of No. R-15, including a new headbox and improvements to the stock delivery system. Machine speed was raised from 250 fpm to 300 fpm, increasing capacity for Nos. 4 and 5 by about 20,000 tpy. When the new machine is installed, the mill plans to close down four of its older machines.

The pulp mill expansion will raise pulping capacity by 25% or by 212 tpd. When completed, a pulp dryer that has been producing roll pulp will be shut down. Boise will contribute $20 million to the $180-million cogeneration facility under construction in a partnership with Bechtel Corp. Boise will be a limited partner in the plant.

Paper produced at the mill is sold primarily for use in magazines, catalogs, direct mail, inserts and other commercial printing, and books. The mill currently has about ten paper machines, most of which are old and small in size, except for a 314-in. machine that was installed in 1981 and a 189-in. machine that was completed in 1964. ■

Major North American coated paper expansions.

Company	Location	Capacity (000 tpy)	Startup date
Blandin Paper Co.	Grand Rapids, Minn.	220 CGW[1]	1989
Champion Papers	Sturgeon, Maine	33 CGW	1989
Consolidated Papers Inc.	Stevens Pt., Wis.	80 SP[1]	1989
International Paper Co.	Corinth, N.Y.	100 CF	1989
Champion Papers	Sartell, Minn.	—CGW	1989
Repap Enterprises Inc.	Newcastle, N.B.	200 to 260 CGW/CF	1989
Fraser Paper	Madawaska, Maine	—CGW	1990
Westvaco Corp.	Wickliffe, Ky.	100 CF	1990
Champion Papers	Quinnesec, Mich.	205 CF[1]	1990
Scott Paper Co.	Skowhegan, Maine	215 CF[1]	1990
Scott Paper Co.	Muskegon, Mich.	30 CF	1990
Consolidated Papers Inc.	Wisconsin Rapids, Wis.	212 CF[1]	1991
Boise Cascade Corp.	Rumford, Maine	318 CGW[1]	1993
Proposed			
Blandin Paper Co.	Grand Rapids, Minn.	250 CGW[1]	n.a.
Bowater Southern	Calhoun, Tenn.	260 CGW[1]	n.a.
Fraser Paper Ltd.	Madawaska, Maine	—CGW[1]	n.a.
GNN/MD Paper	Jonquiere, Que.	75 CGW[1]	n.a.
James River Corp.	St. Francisville, La.	—CGW[1]	n.a.
Mead Corp.	Escanaba, Mich.	—CGW[1]	n.a.
Parton Inc.	Niagara, Wis.	92 CGW	n.a.
International Paper Co.	n.a.	—CF	n.a.
Repap Enterprises Inc.	The Pas, Man.	—CF	n.a.
Weyerhaeuser Paper Co.	Columbus, Miss.	n.a.	n.a.

1. New machines.
CGW—Coated groundwood; CF—coated free-sheet; SP—specialty; n.a.—not available.
Source: *Pulp & Paper Week*

Consolidated plans coated free-sheet machine

Directors of Consolidated Papers Inc. conditionally approved a major expansion of coated free-sheet paper at the company's Wisconsin Rapids Div. Plans call for a new 212,000-tpy paper

machine at a cost in excess of $400 million. Construction is scheduled to begin in first-quarter 1990, and start-up would be in late 1991.

Project approval is pending satisfactory contracts with suppliers and air and wastewater permits from state and federal agencies, the company said in a public statement. As is traditional with Consolidated, the new machine would be financed primarily through internally generated funds. It would be built west of the current facility located in Wisconsin Rapids, Wis.

The new machine would be a 285-in. fourdrinier with top-wire former and would operate at up to 3,000 fpm. No. 16 machine would produce paper grades in basis weights of 60 to 100 lb, which are used in annual reports, brochures and advertising circulars, and books. These grades have remained in strong demand, and paper from this division has remained on allocation almost continuously since 1980, a spokesman said.

Other equipment included in the project are a new power boiler and turbine, additional water filtration capacity, pulp and water delivery lines from the Kraft Div., a new stock preparation system, a new off-machine blade coater and expansion of the existing coating plant, two supercalenders, a new rewinder and salvage winder, a finished stock retrieval system, and expansion of sheeting capacity at the division's converting plant with fully automated roll storage. Plans are also in the making for the water quality center, which processes wastewater from three manufacturing divisions, to be expanded.

This is the company's largest expansion since beginning operations in 1904, a spokesman said. The last major paper machine expansion was completed in 1986 at the Biron Div. for $207 million. That 180,000-tpy machine produces lightweight coated (LWC) paper. Consolidated is also currently upgrading the 59,000-tpy LWC specialty paper machine at Stevens Point, Wis., at a cost of $110 million. These grades are used in food and consumer product packaging and labeling. Startup is scheduled for late 1990.

• Madison Paper Industries recently filed a site permit as a prelude to possible expansion of the Madison, Maine, supercalendered mill. Published reports said the company may add a new 170,000-tpy paper machine similar to the 175,000-tpy machine currently in operation. The project would cost around $300 million and include expansion of the pressurized groundwood pulp mill, the report said. Machine startup would be in July 1991.

However, the company is considering other sites should Maine not come through with certain incentives. The state recently passed investment tax legislation that would favor a capital investment such as this, sources said. A decision on whether or not to proceed may be made by the end of November. ■

Makin still attempting to launch mill project in 1991

Under new direction from former Nortek Forest Products Ltd. CEO Peter E. Von Sass, Makin Pulp & Paper Ltd. appears to be progressing in getting plans for the long-delayed Britannia Beach, B.C., 220,000-metric-tpy coated publication paper mill off the ground.

Von Sass said that construction would start in the fourth quarter. If all goes as currently expected, the estimated C$400-million greenfield mill would start up sometime in early 1991.

Von Sass, who helped put together Nortek's 100,000-tpy hardwood market pulp mill project, was named president of Makin in January. Makin has tried for several years to get its mill built, at first staking out a plot in Alberta and later transferring to the Britannia Beach site. Last year, the company was awarded timber rights by the province, and this summer it received the final agreement signed by British Columbia Forest Minister Dave Parker, noted Von Sass.

The mill will make coated Nos. 3 and 5 groundwood grades as well as uncoated printing/writing paper using the alkaline process, noted Von Sass. The primary end users will be magazine publishers and catalog and advertising insert printers on the West Coast.

A bleached chemi-thermomechanical pulp mill that will meet the paper machine's fiber requirements is also included in the project. In recent months, engineering design for the mill complex has been completed, and major equipment suppliers have been secured—primarily from Austria and Fed. Rep. Germany. ■

SALES AND EARNINGS

U.S. paper industry profit growth is slowing

Ending three years of double-digit growth, U.S. paper industry earnings rose 9.3% in the second quarter compared with a year earlier, according to a *P&P* survey of results from about 30 companies. This compares with a [illegible] jump in earnings in the first quarter and a 43% surge in profits for all of 1988, compared with the same levels a year ago.

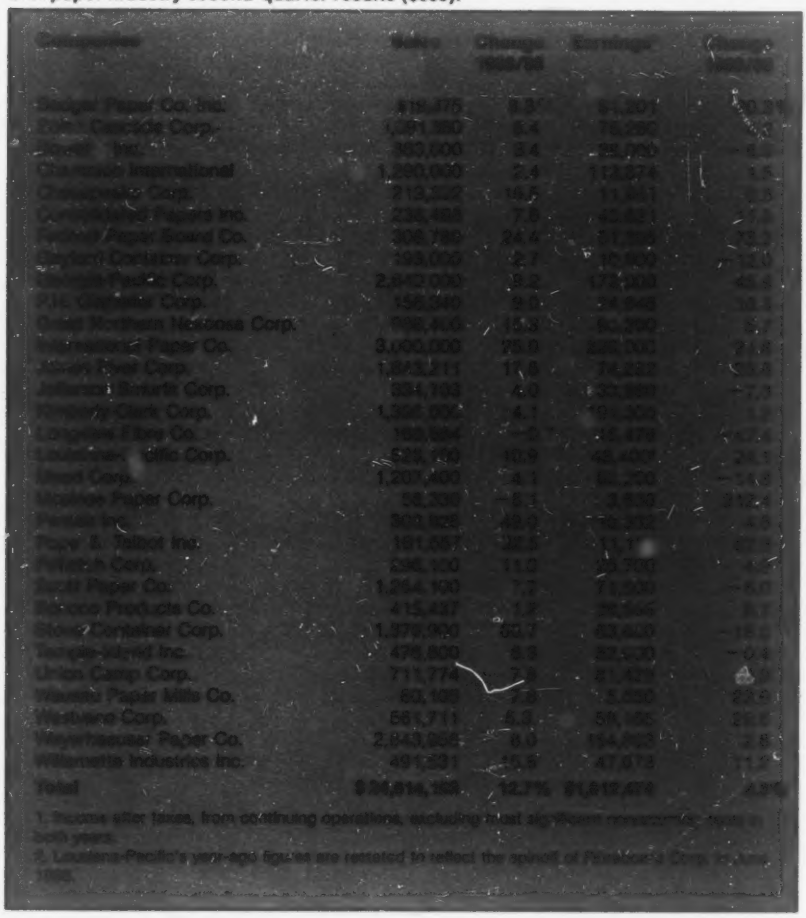
The slowing momentum in earnings reflected softening markets for some printing/writing grades, serious price erosion in newsprint, and a relatively flat performance in containerboard, where producers have gone for more than a year without a price increase. (Just-released U.S. Commerce Dept. statistics show GNP growth slowed to 1.7% in second-quarter 1989.) Bleached market pulp and paperboard, however, remained strong. In a reversal from last year, those companies involved in wood products have been doing well thanks to rising lumber and plywood prices, which have been helped by declining interest rates and have curtailed production in the Pacific Northwest.

International Paper Co. recorded sales of $3 billion on a 22% increase in profits to $229 million. The company said 75% of its sales growth was due to recent acquisitions (Aussedat Rey, Ilford, Masonite). The company said that the strong showings of pulp, paperboard, and packaging businesses compensated for a softening in the uncoated white paper markets. IP noted that inventory work off of coated publication paper ebbed during the quarter, and by the end of the period, orders had returned almost to normal.

Georgia-Pacific Corp.'s 46% rise in earnings, to $172 million on sales of $2.6 billion, reflects strength in both paper and wood products operations. The company said that a six-day strike at five of its plywood plants in the South, which ended July 16, would have no effect on earnings in the current quarter.

Weyerhaeuser Paper Co.'s earnings rose 3% to $154 million on $2.6 billion in sales. Chairman and CEO George H. Weyerhaeuser said pulp and paper markets and pricing continue to be generally strong. Some discounting is occurring in newsprint

U.S. paper industry second-quarter results ($000).



and other paper, while container-board packaging markets are relatively stable.

A bitter pill. Stone Container Corp. reported an 18.6% decline in second-quarter profits. The earnings decline was blamed on the unsuccessful price increase, which also caused some loss of business, weakness in newsprint prices, and a "disproportionate level of downtime at certain mills, which represented over 200,000 tons of lost production."

Jefferson Smurfit Corp. reported a 7.3% decline in net income after taking a charge of around $3 million for early debt retirement related to its 50%-owned affiliate, Container Corp. of America. Smurfit has paid down all of the $650 million debt it incurred in buying its CCA stake in 1986.

Union Camp Corp. reported a 9.9% increase in profits for the second quarter. "Demand for linerboard and corrugated containers was healthy, and industry inventories remained low," noted Union Camp chairman and CEO Gene Cartledge.

Federal Paper Board Co. enjoyed a 78.2% increase in earnings, thanks to strong solid bleached sulfate markets. The company said the big jump was largely due to improved results from its Augusta, Ga., 1,200-tpd SBS mill.

Printing paper spotty. Almost all of the printing/writing paper producers said that the market for their products showed weakness in some areas during the quarter. Mead Corp. experienced a 15% decline in earnings and said some of its markets softened, but it expects demand to remain at current levels or slightly above for the rest of the year. Consolidated Papers Inc. reported that demand for lightweight coated paper is not as robust as it has been during the last few years, but the magazine and catalog publishing businesses continued to grow.

Tissue profits soften. Although the U.S. consumer tissue market in the second quarter was healthy, this was not reflected in the earnings of tissue producers because of weakness in unrelated products.

Scott Paper Co.'s earnings fell 5% in the second quarter. The company attributed this mainly to "higher pulp and other manufacturing costs, a difficult environment in Mexico, and slow progress in implementing our food service business strategy." Sales and earnings from its S.D Warren publishing paper division increased 5% and 3%, respectively.

Kimberly-Clark Corp.'s earnings inched up 1.2% to $101 million. K-C attributed this to "sharply lower" results from its newsprint operations. Results for its consumer tissue and disposable diapers businesses rose primarily due to higher selling prices.

James River Corp. said its profits for its fiscal year ending Apr. 30 amounted to $255 million, a 22% increase from the prior year. The company marked its twentieth year in business with sales of almost $6 billion, a 15% increase.

Wood products setting records. Pope & Talbot Inc. had a 63% rise in earnings. The company said its wood products sector had one of the best quarters in its history. Demand for lumber was strong, and prices for lumber and woodchips were high enough to help offset higher log costs. Willamette Industries Inc.'s profits rose 11%. Record plywood prices and strength in lumber and composite panel markets fueled the increase.

Boise Cascade Corp. reported a 4.2% increase in second-quarter profits, noting that a strong performance in building products helped offset weaker results from the company's paper and paper products operations. Louisiana-Pacific Corp. reported the best quarterly results in its history. ■

Canadian industry earnings continue downward spiral

Canadian pulp and paper industry profits continued their slide in the second quarter, dropping 19.1% on a 0.3% decline in sales from peak levels the industry enjoyed a year ago. The rising Canadian dollar (which recently topped the US85¢ level) and softening newsprint prices were the two main factors blamed for the earnings decline, which was partly offset by

continuing strength in market pulp. Higher stumpage costs in British Columbia were also cited by several West Coast producers as a reason for the continuing profit decline. Noranda Forest Inc.'s earnings were off 16.9% on a 2.5% increase in sales to C$1.25 billion. The company said markets for most of its products, with the exception of newsprint, remained good during the quarter, although they "were clearly past their peak." Higher interest rates and the strong Canadian dollar also adversely affected earnings. Noranda said the year-earlier second-quarter results included a net gain of C$36 million from the sale of its investment in Polysar Energy & Chemical Ltd. The company's outlook for the rest of 1989 is positive, as operations are running close to capacity and markets for its products are remaining "generally firm."

MacMillan Bloedel Ltd., which is controlled by Noranda, posted profits of C$68.3 million, down 27.7% from second-quarter 1988, on a 1.2% increase in sales to $862 million. President and CEO Ray Smith attributed the decline to a stronger dollar and higher costs in British Columbia and said, "Although earnings will not reach the levels of 1988, the company expects a solid performance for the year." Increases in pulp prices and higher earnings from the Japanese market due to an increase in lumber prices and volumes helped to offset the drop in newsprint prices.

Abitibi-Price Inc. reported a profit of C$28.8 million on sales of C$830 million—down 47.1% and 0.7%, respectively, from the same quarter last year. Abitibi, the largest newsprint producer, cited current newsprint prices—which now range from about US$550 to $560/metric ton in the East—and the stronger Canadian dollar as the main reasons for its sagging profits. Chairman and CEO Bernd K. Koken said the company's printing paper group experienced lower operating profits as a result of softening markets, rising kraft pulp costs, and a stronger Canadian dollar. He said the group is expected to pick up later this year as a result of "great improvement in the coated paper division."

Canadian Pacific Forest Products Ltd. experienced a decline in both earnings and sales for the quarter, dropping 1.9% and 1.6%, respectively. Once again the company attributed the loss to the newsprint market and currency appreciation. "Positive factors were improved prices and increased shipments of market pulp," said Cecil S. Flenniken, chairman, president, and CEO.

Canadian paper industry second-quarter earnings (C$000).

Company	Sales	Change (%)	Earnings	Change (%)
Abitibi-Price Corp.	830,000	−0.7%	$28,800	−47.1%
Canadian Pacific Forest Products Ltd.	711,000	−1.6	72,600	−1.9
Cascade Corp.	222,200	−2.6	28,700[1]	−13.2
Consolidated-Bathurst Inc.	1,000,000	6.9	9,000	19.4
Domtar Inc.	822,000	7.1	28,000	4.2
Donohue Inc.	168,200	4.5	10,900	−40.4
Fletcher Challenge Canada Ltd.	366,000	−8.9	36,900	−27.4
MacMillan Bloedel Ltd.	862,000	1.2	68,300	−27.7
Noranda Forest Inc.	1,250,000	2.6	50,000[2]	−16.9
Repap Enterprises Corp. Inc.	274,300	10.1	22,100	0.8
Rolland Inc.	114,800	4.6	(155)	−118.4
Scott Paper Ltd.	79,270	−0.7	5,022	−26.8
Tembec Inc.	87,826	9.5	10,392	20.8
Weldwood of Canada Ltd.	188,900	−21.3	16,000	−21.0
Total	$5,922,105	−0.3%	$466,749	−18.1%

1. Income after taxes from continuing operations, excluding most significant nonrecurring items in both years.
2. Canfor's year-earlier figure restated to reflect a $38.5-million gain on the sale of certain assets. Noranda's year-ago figures restated for an accounting change.

Another victim of the bloated newsprint market in the second quarter was Fletcher Challenge Canada Ltd. Company profits sank 27.4% on a 6.9% drop in sales to C$366 million. Chairman and CEO Ian Donald also blamed the stronger Canadian dollar and poor wood products markets in North America for this decline. 'The market for newsprint has eased somewhat, but the most significant impact on our first-half results was the increase in the value of the Canadian dollar, which has strengthened 5¢ on its U.S. counterpart to 84¢ up from 79¢ a year ago." ■

LINERBOARD

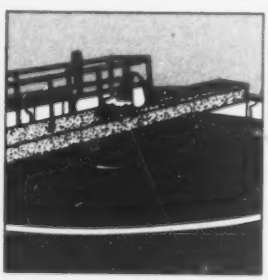
Kenaf of North America to build 750-tpd recycled mill

Kenaf of North America Inc. announced that it plans to build a greenfield 100% recycled linerboard mill in Muskogee, Okla., at a cost of $130 million. The new mill will come onstream in late 1991. It will make high-performance liners, white-top linerboard, and mottled white linerboard along with the standard liner grades, the company said. Most of the output is expected to be sold to independent converters.

Inland Container Corp.'s 575-tpd mill in Ontario, Calif., is currently the largest 100% recycled linerboard mill in the U.S. That mill started up in late 1985 and also cost $130 million to build. Kenaf of North America noted in its press release that the Greater Muskogee Development Corp., a nonprofit group, "provided early assistance in financing a marketing study and has provided later assistance in the form of financing and a favorable price for the site of the mill." According to reports, Llama Co., Fayetteville, Ark., has been retained as investment banker. A company spokesman said that Kenaf had negotiated a good construction contract, and he believes that $130 million is a fair price for the mill.

PULP MILLS IN U.S. WILL HAVE TO MEET LIMITS ON DIOXIN DISCHARGES BY 1992

Under Section 304L of the Clean Water Act, kraft pulp mills will be required to reduce dioxin levels in receiving streams to 0.013 ppq



By REGINA McGRATH, News Editor

Eighty-eight of the 104 bleached kraft mills in the U.S. have been put on the short list under Section 304L of the Clean Water Act because of trace amounts of dioxin in their effluent, according to the Environmental Protection Agency. This means that most kraft pulp mills in the country will have to meet specific limits on dioxin discharges in their effluent by June 4, 1992.

Boise Cascade Corp.'s mill in International Falls, Minn., was the first pulp and paper mill in the U.S. to be issued a final effluent permit that contains a dioxin limit, according to EPA Region 5. The permit requires the mill not to exceed a daily level of 10 ppq (parts per quadrillion) of 2,3,7,8-TCDD in its effluent after its expansion is completed. (Ten ppq is the lowest level to which technology can measure.)

As reported, EPA Region 1 has issued draft effluent permits that contain dioxin limits to four mills in the Northeast (*P&P*, May 1989, p. 31). A spokesman for Region 1 said recently that the companies involved made a "very significant, well-presented reaction to the draft permits." He said that the comment from James River Corp., Berlin, N.H., contained a mathematical model for dioxin uptake for site-specific use that was developed by a contractor hired by the National Council of the Paper Industry for Air & Stream Improvement (NCASI). This model reportedly is able to take into account the effects of a specific mill's effluent discharge on the actual receiving stream, what kind of fish are in the receiving water, how easy it is to fish there, and other factors that could obviate the need to obtain the low levels of the draft permits. (The draft permit for James River's Berlin mill limits dioxin discharges in toxic equivalents to 0.4 ppq.) It is probable that NCASI will offer the model for use to member companies of the American Paper Institute.

In contrast, EPA is using its ambient water quality standard for dioxin in streams of 0.013 ppq and working backward from that to write the dioxin limits in discharge permits.

A lot of sticky questions, many of them legal rather than technological, have to be answered about dioxin regulations. Paper companies are having their legal staffs review the permits. While the states are being told to write NPDES permits to comply with Section 304L of the Clean Water Act by 1992, EPA, under a consent decree, is supposed to determine by April 1990 whether or not dioxin in effluent needs to be regulated.

Separately, EPA's Office of Water has said it plans to revise the best-available-technology guidelines by 1993 to include dioxin, furans, and possibly other chlorinated compounds. These conflicting deadlines make it difficult for the states to proceed with permitting. There is also the question of why some states listed their mills on the 304L short list and why others did not.

FISH NEAR MILLS CONTAMINATED. As of late spring, EPA's National Bioaccumulation Study found chlorinated dioxins and/or furans in fish tissue near 83 of 96 pulp and paper mills surveyed that use chlorine to bleach pulp. Because of the finding, EPA has recommended to states that they develop individual control strategies for every mill where 2,3,7,8-TCDD is detected in fish, unless a state-adopted numeric water quality criterion for this dioxin is not being violated. This is problematic because states may not be able to determine if a violation is occurring because technology cannot measure to such low levels.

API and the National Forest Products Assn. have written to EPA's Office of Water to express their con-

cerns with this policy. The Bioaccumulation Study is monitoring the presence of 67 highly bioaccumulative pollutants in fish at 400 sites in the U.S., including the 104 mill sites. Preliminary comparisons indicate that dioxin is generally higher in fish from sites near kraft pulp mills than from other sites.

DATA IN FROM 104 MILLS. The testing for trace levels of dioxin in pulp, effluent, and sludge under the joint EPA/API 104-mill study has been completed for the kraft pulp mills. Samples from the sulfite mills presented analytical difficulties and took longer to analyze. EPA reported that preliminary results from the study indicate that dioxin may be detectable in about 80% of the mills' effluents (Table 1). Pulp tests reveal the presence of dioxins and furans at levels ranging from undetectable to 311 ppt. The study does not detail the specific paper products made from pulp produced at the various mills—information that environmental groups, such as Greenpeace, believe should be available to consumers.

TABLE 1. **U.S. EPA/paper industry cooperative dioxin study preliminary data for dioxin in mill effluent.**

Mills (by state)	2,3,7,8-TCDD concentration in effluent (ppq)
Container Corp. of America, Brewton, Ala.	6.5
James River Corp., Butler, Ala.	23.0
Alabama River Pulp Co., Claiborne, Ala.	42.3
Kimberly-Clark Corp., Coosa Pines, Ala.	35.0
Champion International, Courtland, Ala.	77.0
Gulf States Paper Corp., Demopolis, Ala.	38.0
Boise Cascade Corp., Jackson, Ala.	107.5
International Paper Co., Mobile, Ala.	n.q.
Scott Paper Co., Mobile, Ala.	14.0
International Paper Co., Selma, Ala.	81.0
Nekoosa Papers Inc., Ashdown, Ark.	41.0
Georgia-Pacific Corp., Crosset, Ark.	96.0
Potlatch Corp., McGehee, Ark.	40.0
International Paper Co., Pine Bluff, Ark.	110.0
Stone Container Corp., Snowflake, Ariz.	5.5
Simpson Paper Co., Anderson, Calif.	250.0
Gaylord Container Corp., Antioch, Calif.	49.0
Simpson Paper Co., Fairhaven, Calif.	100.0
Louisiana-Pacific Corp., Samoa, Calif.	n.q.
Champion Papers, Cantonment, Fla.	11.0 n.d.
Georgia Pacific Corp., Palatka, Fla.	16.0
Stone Container Corp., Panama City, Fla.	7.6 n.d.
Buckeye Cellulose Corp., Perry, Fla.	27.0
St. Joe Paper Co., Port St. Joe, Fla.	21.0
Federal Paper Board Co. Inc., Augusta, Ga.	16.0
Brunswick Pulp & Paper Co., Brunswick, Ga.	30.0
ITT Rayonier Inc., Jesup, Ga.	23.5
Buckeye Cellulose Corp., Oglethorpe, Ga.	12.0 n.d.
Gilman Paper Co., St. Marys, Ga.	6.5 n.d.
Potlatch Corp., Lewiston, Idaho	75.0
Willamette Industries Inc., Hawesville, Ky.	11.0 n.d.
Westvaco Corp., Wickliffe, Ky.	35.0
International Paper Co., Bastrop, La.	330.0
Boise Cascade Corp., DeRidder, La.	9.2
James River Corp., St. Francesville, La.	82.0
Georgia-Pacific Corp., Zachary, La.	190.0
Westvaco Corp., Luke, Md.	16.0
Scott Paper Co., Hinkley, Maine	17.5
Lincoln Pulp & Paper Co. Inc., Lincoln, Maine	32.0
James River Corp., Old Town, Maine	39.0
Boise Cascade Corp., Rumford, Maine	120.0
Scott Paper Co., Westbrook, Maine	6.3
Georgia-Pacific Corp., Woodland, Maine	6.8
Mead Corp., Escanaba, Mich.	17.0 n.d.
Scott Paper Co., Muskegon, Mich.	8.4 n.d.
Champion Papers, Quinnesec, Mich.	9.0
Potlatch Corp., Cloquet, Minn.	24.0
International Paper Co., Moss Point, Miss.	160.0
International Paper Co., Natchez, Miss.	38.0
Leaf River Forest Products Inc., New Augusta, Miss.	200.0
Stone Container Corp., Missoula, Mont.	3.1
Champion Papers, Canton, N.C.	n.q.
Weyerhaeuser Paper Co., New Bern, N.C.	44.0
Weyerhaeuser Paper Co., Plymouth, N.C.	320.0
Federal Paper Board Co. Inc., Riegelwood, N.C.	n.q.
James River Corp., Berlin, N.H.	59.0
International Paper Co., Ticonderoga, N.Y.	21.0
Pope & Talbot Inc., Halsey, Ore.	30.0
Boise Cascade Corp., St. Helens, Ore.	22.0
International Paper Co., Erie, Pa.	24.0
Appleton Papers Inc., Roaring Spring, Pa.	11.0 n.d.
P.H. Glatfelter Co., Spring Grove, Pa.	8.4 n.d.
Bowater Carolina, Catawba, S.C.	24.0
Union Camp Corp., Eastover, S.C.	20.0
International Paper Co., Georgetown, S.C.	565.0
Bowater Southern, Calhoun, Tenn.	6.8 n.d.
Mead Corp., Kingsport, Tenn.	6.0
Temple-Eastex Inc., Evadale, Texas	n.q.
Champion Papers, Houston, Texas	n.q.
Simpson Pasadena Paper Co., Pasadena, Texas	n.q.
International Paper Co., Texarkana, Texas	15.5
Union Camp Corp., Franklin, Va.	68.0
Chesapeake Corp., West Point, Va.	16.0
James River Corp., Camas, Wash.	n.q.
Weyerhaeuser Paper Co., Everett, Wash.	33.0
Longview Fibre Co., Longview, Wash.	4.6 n.d.
Weyerhaeuser Paper Co., Longview, Wash.	9.2
Simpson Tacoma Kraft Co., Tacoma, Wash.	n.q.
Boise Cascade Corp., Wallula, Wash.	360.0
Wausau Paper Mills Co., Brokaw, Wis.	4.2 n.d.
James River Corp., Green Bay, Wis.	9.7 n.d.
Nekoosa Papers Inc., Port Edwards, Wis.	40.0
Pentair Inc., Park Falls, Wis.	5.4 n.d.
Badger Paper Mills Inc., Peshtigo, Wis.	7.1
Weyerhaeuser Paper Co., Rothchild, Wis.	12.0

n.d. = Not detected. In these cases the value reported is the detection limit.
n.q. = Not quantified. Lab analyses are being rerun for these samples.
Note: Where more than one value was given, *Pulp & Paper* averaged the values unless they were too divergent to be meaningful.
Source: Environmental Protection Agency and the America Paper Institute.

. . . there is a divergence of opinion on how to express risk and on the validity of testing protocols . . .

EPA is planning to present the findings from the 104-mill study Sept. 17-22 at the International Dioxin Symposium to be held in Toronto, Ont. It will also place a notice in the *Federal Register* (probably this month) alerting the public that the results are available. The bound report will probably come out next spring, a spokeswoman for EPA said. This is about the same time that the Office of Toxic Substances will have its risk assessments done. It is probable that next spring, hearings on dioxin pollution will reconvene.

Meanwhile, the Office of Technology Assessment, which works for Congress, has issued a report entitled "Technologies for Reducing Dioxin in the Manufacture of Bleached Wood Pulp."[1] The 74-page report is a good review of the studies on dioxin conducted so far and possible methods to reduce dioxin discharges. OTA recognized what those in the industry have known all along: there is no silver bullet for reducing TCDD and TCDF in bleached pulp. Instead, several technologies and/or process modifications may be used individually or in combination:

- Extend delignification of pulp before bleaching.
- Improve brownstock washing.
- Substitute nonchlorinated bleach agents.
- Substitute chlorine dioxide for some or all of the chlorine.
- Apply multiple additions of chlorine in split charges instead of a single massive charge.
- Improve chemical mixing with the pulp.
- Adjust the acidity of the unbleached stock before adding chlorine.
- Use cleaner oil-base defoamers.
- Remove dioxin precursors prior to the addition of chlorine.
- Improve secondary waste treatment and disposal.

CONSUMER SAFETY. Because of the lack of published independent government research on the risks associated with dioxin in paper and mill worker exposure, OTA said it had to rely almost wholly on industry-sponsored research. One of the chief concerns of environmental groups is that NCASI's risk assessments failed to consider the cumulative risk of using a wide range of paper products daily. They also feel a risk assessment should take into account the potential risks from the several hundred other chlorinated byproducts that are found in paper products. In a hearing held in November 1988, OTA found that there is a divergence of opinion on how to express risk and on the validity of testing protocols for determining the rate of migration of dioxin from paper products to the body.

To address these concerns, EPA established an Interagency Task Force on Dioxin that includes the Food & Drug Administration plus the Consumer Products Safety Commission. The group will try to determine if a risk exists, based on the 104-mill study and estimates of migration rates. It also will include an assessment, based on product use scenarios, of technologies that could reduce dioxin exposure.

A spokesman for FDA said that a draft report of the tests on milk before and after it is packaged in solid bleached sulfate (SBS) cartons exists and the data are being reviewed. He said that the data would ultimately be made public but could not say when. The data will be turned over to EPA in October as part of FDA's summary of the risks associated with various food packaging products. The analysis of milk was supposed to have been completed by Apr. 1, 1989 (*P&P*, April 1989, p. 135).

As reported, Canada is in the midst of a nationwide test of milk packaged in SBS cartons (*P&P*, May 1989, p. 33). This came as a result of a test conducted in Quebec on 140 milk samples that found trace levels of furans in milk packaged in SBS cartons. Suppliers of milk cartons made out of bleached board have committed to supplying to Canada SBS board that does not result in any detectable level of dioxin in milk.

A study conducted during March and April of this year by the Dept. of Health in New Zealand found that unpackaged milk and milk packaged in glass or plastic contained "virtually undetectable" levels of dioxin.[2] The tests showed that dioxin leached from the paperboard cartons into milk and cream in the range of 0.012 to 0.216 ppt for standard homogenized milk (16 samples), 0.130 to 0.263 ppt for skim milk (four samples), and 0.138 to 0.432 ppt for cream (four samples). The study found that although these levels of dioxin equivalents are not considered to be a health risk, they contribute to the body burden of dioxin. The paperboard packaging industry in New Zealand has provided new packaging, and levels of dioxin in milk are being monitored.

Meanwhile, the National Institute of Occupational Safety & Health is conducting a health hazard evaluation of mill workers exposed to dioxin and other chlorinated organics in normal mill operations (*P&P*, April 1989, p. 136). NIOSH has visited mills to determined where exposure could happen. Its funds are limited, and each blood test would cost about $1,000 to $1,200, so it will initially test people most likely to be exposed. ■

REFERENCES

1. The OTA report can be ordered for $3.75 from the Government Printing Office (stock number 052-003-01154-9), Washington, D.C. 20402-9325.
2. This study can be ordered from Health Protection Program, Dept. of Health, P.O. Box 5013, Wellington, New Zealand.

INFLUX OF ENTRY-LEVEL ENGINEERS DROPS MEDIAN INCOME TO $52,000

Slight decline from 1988 salary level can also be attributed to increased retirement of veteran employees and the industry's push for new engineers

By KELLY H. FERGUSON, Projects Editor

Despite record profits in the pulp and paper industry during the past year, professional salaries appear to have declined slightly, based on *Pulp & Paper*'s 1989 salary and opinion survey. However, this decline in median income—to $52,000 in 1989 from $53,000 in 1988—is probably due to an increasing number of newer employees in the industry and the retirement of some older employees.

While the majority of respondents were more than 40 years old (50.3%), the largest increase in age categories came from the 30 and under age group. Another factor that suggested a possible increase in younger engineers is that 39.2% of respondents said they have been with their present employer only five years or less. In actual number of years, 11.4% of the respondents said that they have been with their current employer one year or less.

BACKGROUND OF SURVEY. *P&P*'s fifth annual survey is based on responses to a questionnaire included in the May 1989 issue. Information from the returned forms was processed by an independent data processing firm according to *P&P*'s specifications. Data from 1989 are compared with data from our 1988 survey to provide readers with perspective on changes in compensation, benefits, and employee attitudes. This comparison should give an indication of personnel trends in the industry at the peak of capacity and capital spending.

The report is designed to compare the progress of engineers in the paper industry, on the supplier and consulting side as well as in primary manufacturing, with professional peers in various other disciplines. In addition, the report also compares the salaries of specific engineering types and functions within the paper industry.

AN OVERALL PROFILE. Respondents' median income decreased 2% from 1988, but the largest decreases came

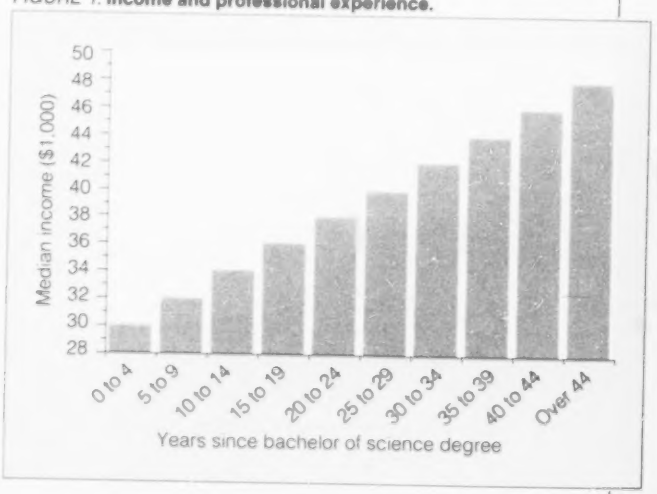
TABLE 1: **Salary distribution of all respondents.**

	Salary ($1,000)		
	1989	1988	% change 1988-89
Lower decile	33	35	−6
Lower quartile	41	42	−2
Median	52	53	−2
Upper quartile	65	66	−2
Upper decile	79	85	−8

TABLE 2: **Benefits of respondents.**

	% of respondents	
Benefit	1989	1988
Medical insurance	98.7	92.8
Life insurance	94.7	89.8
Retirement pension plan	88.9	83.8
Dental insurance	84.4	78.5
Education allowance	49.9	47.2
Stock option plan	41.4	39.5
Profit sharing	36.8	37.1
Bonus plan	33.7	31.8
Travel budget	28.0	24.7
Company car	13.1	12.2

FIGURE 1: **Income and professional experience.**



On Reader Service Card Circle 207 For Mount Vernon Wet Felts or 208 For Mount Vernon Forming Fabrics.

Reader opinions

Pulp & Paper's salary survey asked readers for comments on their jobs, companies, or the industry. Opinions focused mainly on salaries and benefits, problems with management, and reasons for low morale. Also, a number of respondents commented on the current trend of the "team concept" and quality improvement. Comments have not been edited for content (only grammar and style as necessary) in order to retain their originality. The following were chosen as typical of responses received.

"My company continues to struggle to make a quality product, but production and ROI [return on investment] still dominate mill decisions. The gulf between top management and middle-level management continues to widen. They pat themselves on the back and give themselves big raises and profit-sharing programs, while middle-level supervisors and engineers are expected to be satisfied with more work and below-inflation-level raises."

—engineering/Northwest

"As with most jobs in this mill, communication between departments is terrible."

—production/Northeast

"The paper industry—as is American industry in general—is driven by the short-term profit picture, as controlled by the investment community, which collectively is ruining American industry."

—production/Midwest

"U.S. quality is a myth."

—administration/Northwest

"Leveraged buyouts are ruining our nation—creating a lot of 'fat cats' and unemployed workers!"

—technical service/Midwest

"Private-sector employees have no idea how hard their counterparts in the federal government work. Much preparation and effort is needed in representing the U.S. paper industry's concerns in international circles."

—R&D/East

"Profit sharing is necessary if we are serious about employee involvement and changing behavior and the U.S. business culture."

—quality control/Southeast

"It is hard to prove my value to the company. I started young and have had to work hard to change management's opinion of me as I have grown. This is frustrating and affects my morale."

—maintenance/Northeast

"This company cares far greater for equipment welfare and maintenance than for any of the employees."

—engineering/Southeast

"Corporations are not putting resources into their youth, giving you no other choice but to look for a new job."

—sales/Northeast

"I love being in business for myself. I highly recommend it."

—consulting/Northeast

"I have found paper company management to be very archaic, heavy handed, and resistant to change."

—R&D/Northeast

"I work with a socio-technical system. We have a 'pay for knowledge' system. The vision is to eventually (in five to eight years) have self-reliant teams."

—production/Midwest

"Engineers, in general, are not paid enough or treated professionally. We need a union!"

—consulting/Southeast

"Management: I've yet to have a good manager. Most are engineers who don't know how to manage or just don't care. And the company I work for doesn't offer any management training. As a result, morale is low. There isn't a team feeling—work isn't done productively.

"Working conditions: 400 of us are crammed into a large room with no partitions, and upper management—sitting in their nice, big, quiet offices—wants no socializing. What do they expect? Engineers are treated not like professionals but like school children.

"Discrimination: Men in my company are paid considerably higher than women, and respect and promotions for women are hard to come by. Also, if men are talking to one another or on the phone, they are 'networking' or conducting business. If it's a woman, they are 'gossiping' or 'socializing,' though it isn't necessarily true. We have no women in management positions."

—sales/male/Northeast

"With the record profits my company is making, they sure are not sharing them with any of the workers—salary or union. I think they are out of touch with the real world and inflation."

—production/Northwest

"Companies appear to be getting rid of older employees. The young are taking over."

—engineering/Southeast

"One hundred percent travel, as required in corporate engineering, is really tough. And its undervalued by my upper management."

—engineering/Midwest

"My job is not satisfactory because there is no opportunity for advancement. Frankly, I feel that anyone with a forestry background from a rural southern state has little chance of being considered for anything other than land management or wood procurement.

I went back to school for my MBA, and that has not opened any doors. This is not true for engineers, accountants, wood technologists, etc. I intend to stay with this company long enough to fulfill my obligations for the educational reimbursement and then look elsewhere.

I certainly don't plan to look only in the paper industry because there is little opportunity for advancement."

—production/Southeast

"Companies need to circulate lists of job openings to help career planning. They also need to rotate job performance evaluators."

—maintenance/Southeast

"Company's performance/merit review is ludicrous—everyone gets the same raise regardless of their performance."

—production/Midwest

"The most important benefit is a retirement plan."

—consulting/Southeast

"After having worked in two industries for three corporate employers, I have come to the belief that salaries are determined by employee age more than any other factor, and that raises are based more on bargaining unit (union) contracts than any other factor."

—engineering/Southeast

"I'm underpaid as a woman vs a man in the same position."

—quality control/Southeast

"There should be laws to force companies to plant one tree for every tree cut, with close supervision for compliance."

—consulting/Canada

"With record profits in the pulp and paper industry, it's time that some money is spent on improving the overall image—become more professionally managed to attract the cream from schools/colleges."

—technical service/Northeast

"Working for this industry beats a poke in the eye with a sharp stick, but not by much."

—consulting/Southeast

"Almost no women in the industry."

—public relations/North

"I like my job, my company, and my industry in general. However, my morale would be much higher if we would stop restructuring for a minute or two."

—management information service/Midwest

"Many decisions are made by upper management, even when they know little about the subject."

—engineering/Michigan

"I'd like to see a technical pay scale that would match the management pay scale."

—engineering/Midwest

"Accountants and executives are making the future bleak for us."

—production/Midwest

"There should be proper recognition of service departments. All mills need very reliable water supply, power and steam supply, and waste treatment."

—environmental control/Northeast

"This industry suffers from world economy swings. Also, high-tech growth is not uniform. When engineering and technology has reached the twenty-first century, operator skills lag behind 15 to 20 years."

—engineering/Southeast

"Coming from another industry, I am surprised that such a large industry can have such a low public profile."

—technical/Canada

"I have found that I've earned more money by changing jobs than by staying with the same company. I also have a position with more responsibility."

—technical service/Northwest

"Pulp and paper employers need to adjust to the changing employee climate in respect to flexible working hours, two career families, and a more technology-oriented work force."

—engineering/Midwest

"The best job in the pulp and paper industry is in R&D. Manufacturing, where I came from, has a long way to go to catch up. My ten years in manufacturing were a nightmare. I wouldn't change my job in R&D for a million dollars in manufacturing."

—R&D/Northeast

"Finally, salaried employees are gaining ground on the hourly work force. Recent contracts containing first-year bonuses plus 2% to 3% raises in later years have made our 4% to 6% raises look good. However, these raises seem relatively small in comparison to corporate profits during the last three years. When pulp and paper markets soften (as they surely will), I wonder if our raises will disappear."

—technical service/Southeast

"I enjoy the paper industry—just struggling with this mill!"

—engineering/Midwest

"Executive greed is rampant in the corporation I work for."

—R&D/Midwest

"The company uses a 'we don't need you' attitude and a 'scream in the face' attitude. They seem to want the employees agitated."

—production/Northeast

"I wish there was a better way to get ahead other than playing politics and/or back-stabbing."

—maintenance/Southeast

"The paper industry is the best of all."

—production/Northeast

"I wish I had less meetings and more working time."

—technical service/Northeast

"Our management is very old-fashioned and too layered. I can't make any decisions without checking with my boss, who checks with his boss, who checks with his boss."

—engineer/Southeast

"The pulp and paper industry is an excellent choice for engineering professionals looking for a rewarding career. I came to this industry from the oil industry, and the difference is tremendous. I would rather work in an industry tied to consumer spending than to the price of oil."

—production/Southeast

"My company is flattening the organization. Now only MBAs go up. The rest of us have to work harder, for less pay and a poor future, and like it or get out."

—sales/Southeast

"People, especially upper management, need to change their attitudes. They need to realize the importance of good workers, job morale, etc. It would be best if people quit their unions and became real company people. Unions will be the demise of this industry."

—consulting/Northeast

"Despite a record year for profits, the company is freezing salaries and cutting benefits, creating an atmosphere of uncertainty, which has caused low morale."

—production/Northeast

"We need more qualified people."

—sales/Midwest

from the lower decile (-6%) and the upper decile (-8%), representing the lowest and highest levels paid to respondents (Table 1). These decreases also give some indication that age groups are shifting within the industry—new employees would receive entry-level salaries, while retirement would cut out some of the higher-paid respondents.

Pulp and paper companies have grown during the year, with a 4% increase in companies having more than $2 billion in annual sales (42.7% in 1989 compared with 38.8% in 1988). Just as last year, most respondents (89.9%) liked their jobs, and 85.3% said they would stay in the paper industry if they changed jobs.

More women responded to the 1989 survey—7% compared with 4.1% in 1988. Also, possibly reflecting the industry's continuing shift southward, 39.7% of respondents live in the Southeast, 22.8% live in the Midwest, and 15.3% live in the Northeast. Other averages for respondents include the following: has a bachelors degree (59.6%), works for a wood products/pulp and paper manufacturer (65.5%) in either production/mill operations (18.1%), technical service/quality control

TABLE 3: **Income and type of employment organization.**

	Income ($1,000)					
Employing organization	**Lower decile**	**Lower quartile**	**Median**	**Upper quartile**	**Upper decile**	**% change in median 1988-89**
Academic	65	65	36	69	69	−53
Government	45	48	36	69	90	+16
Wood/pulp/paper—engineering	31	39	50	63	74	−12
Wood/pulp/paper—manufacturing	34	42	51	71	80	+2
Consulting firm	37	48	65	71	83	+8
Self-employed consultant	40	46	66	80	100	−6
Wood/pulp/paper—supplier	36	43	53	63	78	−13
Wood/pulp/paper—converter	30	39	50	70	85	−6
Other	27	40	55	65	85	−2

TABLE 4: **Income and principal work function.**

	Income ($1,000)					
Principal function	**Lower decile**	**Lower quartile**	**Median**	**Upper quartile**	**Upper decial**	**% change in median 1988-89**
Administration	37	48	65	85	110	−6
R&D	31	40	53	66	77	+13
Consulting	35	50	61	75	100	−5
Engineering design	34	42	51	64	72	−6
Teaching/academic	26	26	30	69	69	−45
Product development	40	45	60	68	82	+7
Production and mill/plant operation	36	43	53	66	80	+2
Engineering/maintenance	34	40	48	57	65	−6
Sales and marketing	35	42	53	65	79	−9
Technical service/quality control	31	36	45	55	64	+2
Other	32	40	50	61	85	−2

TABLE 5: **Income and level of supervisory management.**

	Income ($1,000)					
Supervisor responsibility	**Lower decile**	**Lower quartile**	**Median**	**Upper quartile**	**Upper decile**	**% change in median 1988-89**
None	30	34	41	51	64	−7
Indirect or staff	31	38	46	58	71	0
Team or unit	34	40	48	57	66	−2
Project or section	36	45	53	64	72	−2
Major department or division management	41	52	63	77	92	0
Corporate management of organization	40	55	79	110	121+	−21

(15.6%), or engineering design (15%).

Chemical engineers still make up the largest percentage of bachelor degrees in the industry (17.3%), and business degrees remained almost the same as last year (16.7%). Other degree distributions include mechanical engineering (15.4%) and paper science and technology (13.5%).

Job stability declined 2% since 1988, with 20% having changed employers in the last three years. Of those who have changed employers, 85.2% changed only once. Other statistics include the following:

Compensation:

- Respondents received an average of three salary increases in the past three years (the 1988 survey showed only two salary increases, indicating that because of record profits in the industry, increases have been more frequent).
- The last pay increase was 5% (a 1% decrease from 1988's survey).
- Eleven paid holidays and three weeks of vacation are taken yearly.
- Most salaries are reviewed annually (91.8%) and are based on merit/performance (52.1%), cost of living (4.9%), or both (28.7%).
- 85.1% are not paid overtime.
- 47.4% have not been promoted in the past three years, while 37.9% have been promoted once.

Personal:

- 97.1% of respondents work full-time; 1.9% are self-employed.
- The average respondent's work experience since leaving school is between 15 and 19 years.
- 86.4% of respondents have some kind of manage-

FIGURE 2: **Income and number of years with current employer.**

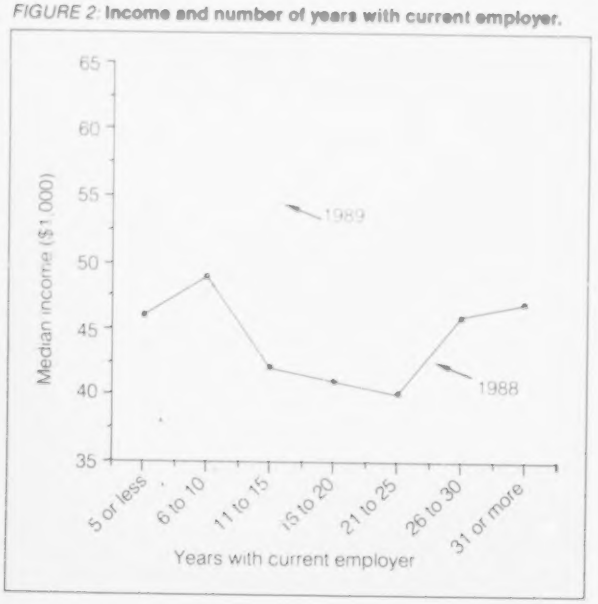


FIGURE 3: **Income and type of wood/pulp/paper company, all respondents.**

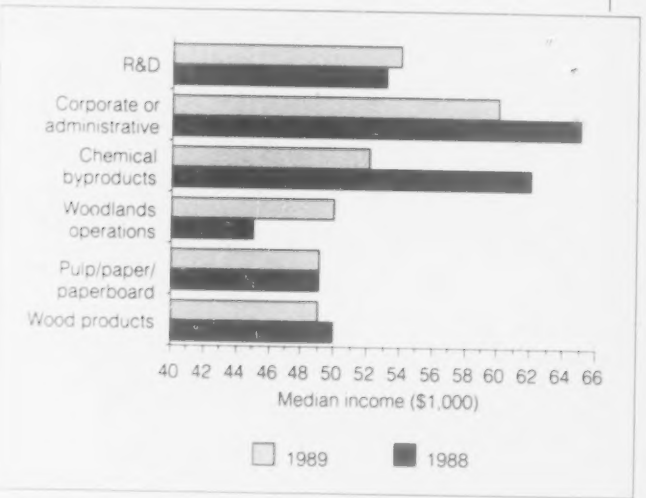


FIGURE 4: **Income and number of employees managed, all respondents.**

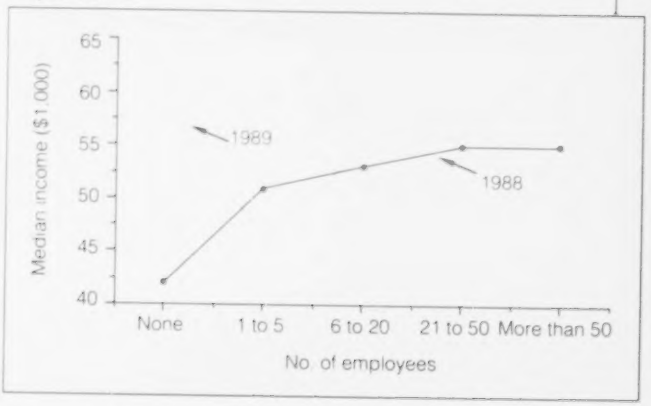


FIGURE 5: **Income and number of years of management experience, all respondents.**

ment responsibility.

- 26% have advanced degrees.
- 38% came from another industry.

Morale:

- 83.5% say their company listens to them and values their experience.
- On a scale of 1 (bad) to 5 (good), 50.9% ranked their job morale as above average (4), and 29.1% ranked their job morale as a 5.

ANALYZING EFFECTS ON INCOME. Tables 1 through 7 and Figures 1 through 8 present survey findings on compensation that compare a number of variables, including degree, discipline, work type and experience, type of employing organization, and supervisory level. Income figures in all tables were obtained by adding any bonuses or additional income reported by respondents to their reported gross salaries.

Table 2 shows that, except for a slight decrease in the

FIGURE 6: **Income distribution of respondents.**

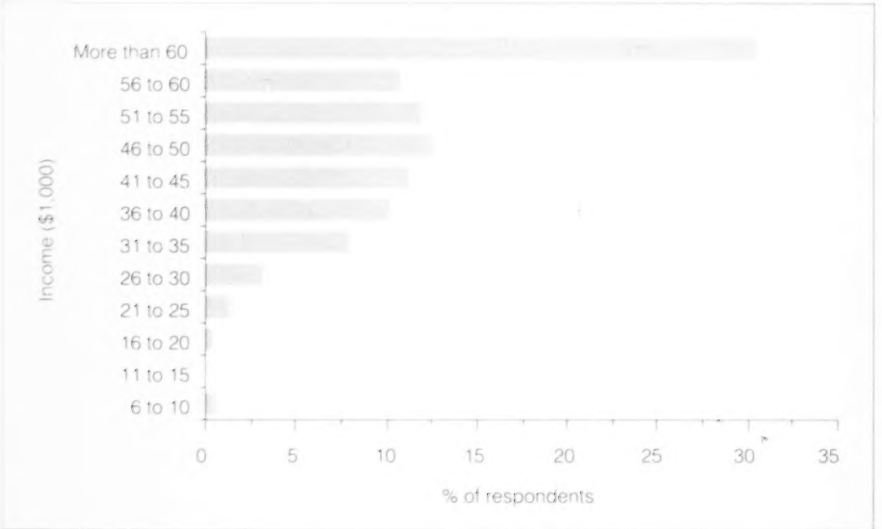


TABLE 6: **Income and educational field (bachelor's degree only), all respondents.**

Discipline	Income ($1,000) Lower decile	Lower quartile	Median	Upper quartile	Upper decile	% change in median 1988-89
Forestry/agriculture	34	46	57	70	94	+2
Chemistry	36	43	51	61	75	−6
Mechanical engineering	35	42	52	67	78	−7
Chemical engineering	33	40	50	65	76	−6
Electrical engineering	39	44	56	65	72	--
Industrial engineering	38	46	56	63	75	--
Mathematics/physics	33	39	53	72	100	−4
Computer science	35	38	37	80	117	−26
Biology/life science	28	28	51	47	47	NA
Paper science and technical	32	38	38	55	68	−22
Environmental science	36	36	44	49	49	−21
Business	30	37	52	68	80	−9
Liberal arts	26	35	39	52	60	−26
Other	29	37	17	62	69	−70

TABLE 7: **Effect of educational field and experience on income (bachelor's degree only).**

Discipline	Median income ($1,000)	Median YSB[1]	% of respondents with YSB[1]<10	Income rank	Experience rank	Median income/ median YSB[1] ($1,000/year)
Forestry/agriculture	58	19	10.8	1	2	3.1
Chemistry	50	21	19.2	4	1	2.4
Mechanical engineering	52	17	26.4	3	3	3.1
Chemical engineering	50	12	41.4	4	5	4.2
Civil engineering	53	14	14.6	2	4	3.8

1. Years since bachelor of science degree.

number of respondents who participate in profit-sharing plans, benefits increased during the year. Especially significant were the increases in medical insurance (98.7%), life insurance (94.7%), and dental insurance (84.4%).

Table 3, comparing income and type of employment organization, shows that consultants have the highest median income—about $65,000. Because of a low response, median salaries for those in academia and government organizations are not statistically significant.

Comparison of income and principal work function (Table 4) shows that the highest median salary ($65,000) belongs to those in administration. The group making the largest increase was from R&D, with a 13% increase in median income to $53,000. Again, the small response from academia means those salaries should not be considered statistically significant.

Those at the corporate management supervisory level (Table 5) had the highest median income ($79,000), although a large (21%) decrease reinforces the probability that a rash of retirements have taken place during the year. Table 6, as with past surveys, possibly presents misleading data comparing income and educational field. Small numbers of respondents in many of the categories makes results difficult to interpret statistically.

Figure 1 shows that median income basically increases with years of professional experience. Figure 2 indicates that staying with one employer pays off, although after 25 years this becomes uncertain. This decrease could be due to long-term salary compression.

Taking into account the low number of responses from those who manage no employees, the more employees managed, the higher the median income (Figure 4). As expected, for those who do manage, income increases with the number of years of management experience.

The editors of *P&P* hope this survey will be useful to our readers. Comments on how it can be improved or on the magazine in general are always appreciated and should be addressed to: Projects Editor, *Pulp & Paper*, 2000 Powers Ferry Center, Suite 450, Marietta, Ga. 30067. ■

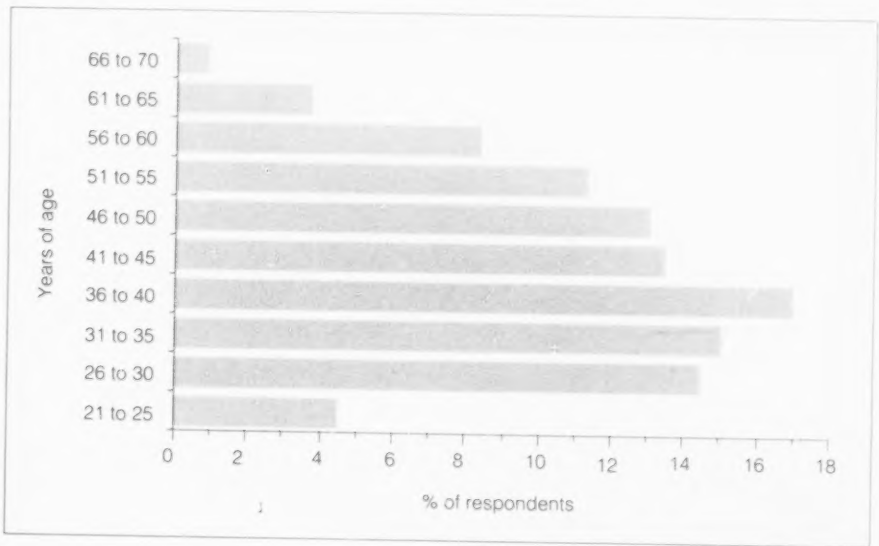


FIGURE 7: **Age distribution of respondents.**

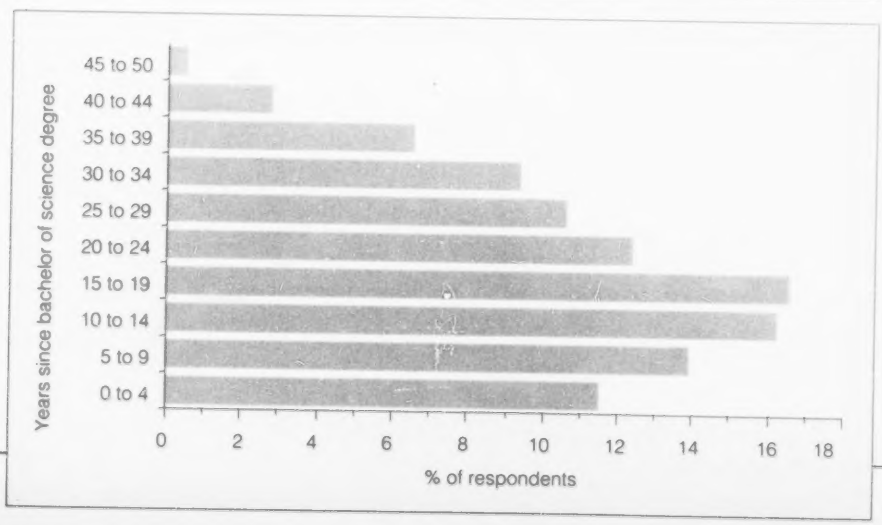


FIGURE 8: **Years of experience distribution of respondents.**

BARGAINING TRENDS POINT TO STABLE ENVIRONMENT FOR MILLS IN THE 1990s

Moderate wage hikes, fewer strikes, longer contracts, and increased employee involvement will lend stability to the industry

By JULIAN M. KIEN

The collective bargaining environment in the U.S. seemed to have hit its highwater mark during the first six months of 1989. After having risen to double-digit figures during the first few years of this decade, wage increases have dramatically fallen, both in the paper industry and in U.S. manufacturing in general. They have fallen to such a degree that in 1986, the Bureau of Labor Statistics reported an average wage *decrease* of −1.2% for the first time in 30 years. Since that time, wage increases in manufacturing have risen modestly and stabilized at about 2.1% for the past three years.

Similarly, wage settlements in the paper industry have also been moderate. From a high of over 10% in 1980, paper industry settlements fell to an average first-year increase of 0.3% in 1986 and have increased gradually to their current 1.1% (Figure 1). Much of this moderation in wage increases is offset to a significant degree by the use of cash payments, some of which are as high as $9,000.

These dramatic changes in settlement patterns in the paper industry have produced a decline in unit labor costs (ULC) in excess of 10% over the past four years, while the manufacturing sector's ULC has experienced a slight upward trend.

Average hourly earnings in the paper industry (the measure of how much a paper worker actually makes) continue to place the paper worker as the sixth highest-paid worker in the U.S., well ahead of steel and chemicals. This has been due to paper worker earnings rising by over 200% in the past 12 years (1977-89)—the highest growth rate in any of the major continuous process industries that I follow.

TWO-TIER SETTLEMENTS. While wages seem to be moving upward, it appears that a two-tier pattern of settlements is developing in the industry. Essentially, the

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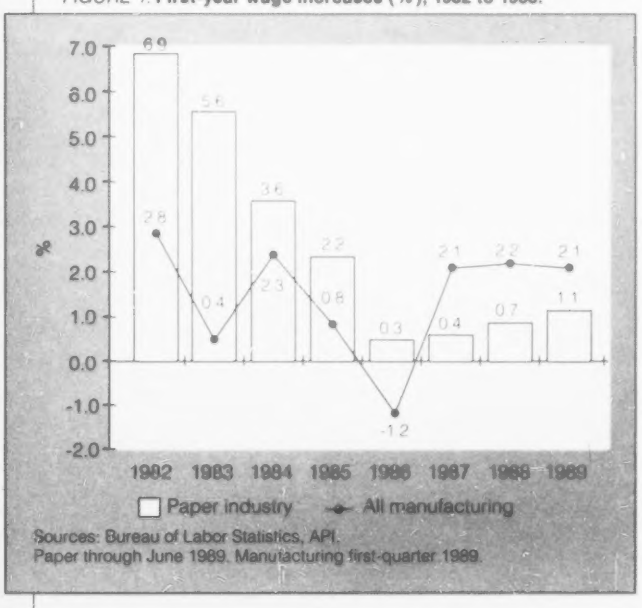
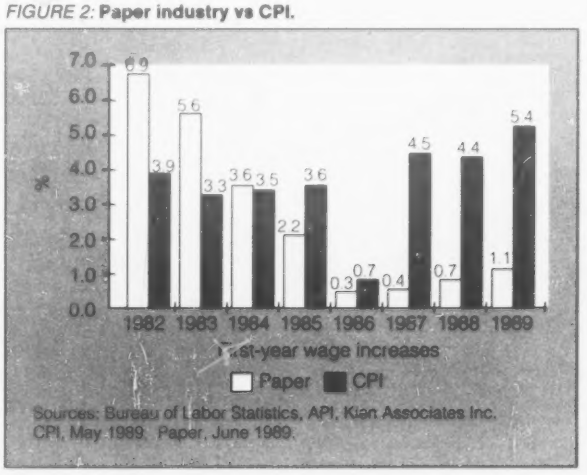
FIGURE 1: **First-year wage increases (%), 1982 to 1988.**



Sources: Bureau of Labor Statistics, API.
Paper through June 1989. Manufacturing first-quarter 1989.

FIGURE 2: **Paper industry vs CPI.**



Sources: Bureau of Labor Statistics, API, Kien Associates Inc.
CPI, May 1989. Paper, June 1989.

larger, integrated companies are settling with no increase in the first year and a 2.0% to 2.5% increase in wages in later years. The smaller, nonintegrated mills are settling at a 2.5% to 3.5% wage range. With the unions using their leverage with the smaller companies, a two-tier pattern is also emerging in how effective companies have been in reducing premium pay costs for work on weekends and holidays.

By eliminating these excessive premiums, companies are able to greatly lower their ULC and offset to some degree the increases in wages and health care costs. Eventually the disparity between the nonintegrated and integrated mills will create significant competitive pressures for those mills to follow the pattern of premium elimination and cost-competitiveness that the majors have been engaged in for the past four years.

While inflation, as measured by the Consumer Price Index, has risen somewhat this year, it is still in the relatively moderate 4% to 5% range (Figure 2). As we look at average increases for companies that settled in the first six months of 1989, however, we see that the average scheduled increase for 1990 and 1991, which has already been negotiated, will be about 2.5%. Obviously, this puts pressure for settlements at this level in those years.

LONG-TERM AGREEMENTS. A greater number of contracts have been opened early and extended (Figure 3). In 1987, four mills reported early settlements. By 1989, 15 were reported. The significant trend toward long-term contracts will also contribute to what I think will be long-term wage stability in the paper industry. In 1986, almost 10% of the contracts settled were for longer

TABLE 1: **Summary of paper industry collective bargaining.**

Bargaining calendar 1989	**Scheduled**	**Completed**
New England	8	5
East	21	8
Midwest	31	10
South	45	18
Pacific Coast	5	0
Total	110	41

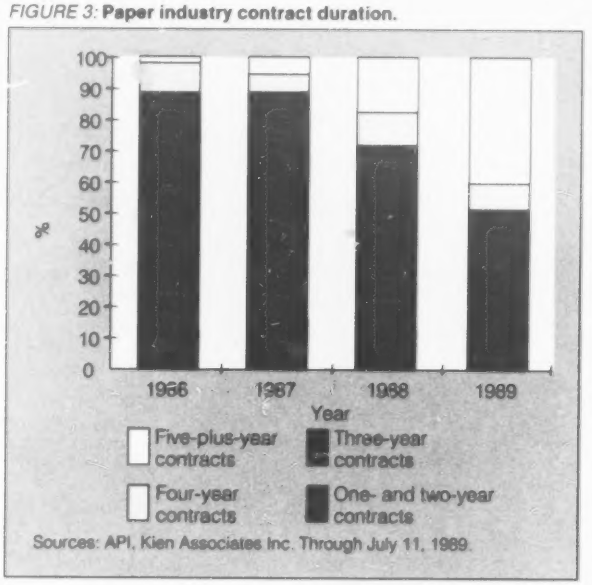
Weighted average increases over term (%)	**1989**	**1990**	**1991**
New England	0.3	2.7	2.3
East	2.8	1.9	3.1
Midwest	0.8	2.4	2.4
South	1.0	2.6	2.7
Pacific Coast	0	2.0	0
National average	1.1	2.5	2.6

Early settlements	**1987**	**1988**	**1989**
New England	—	2	1
East	—	—	2
Midwest	—	—	—
South	4	6	11
Pacific Coast	—	—	2
Total	4	8	16

Strikes	**1987**	**1988**	**1989**
New England	2	2	—
East	2	2	1
Midwest	2	—	—
South	1	—	—
Pacific Coast	2	3	—
Total	9	7	1

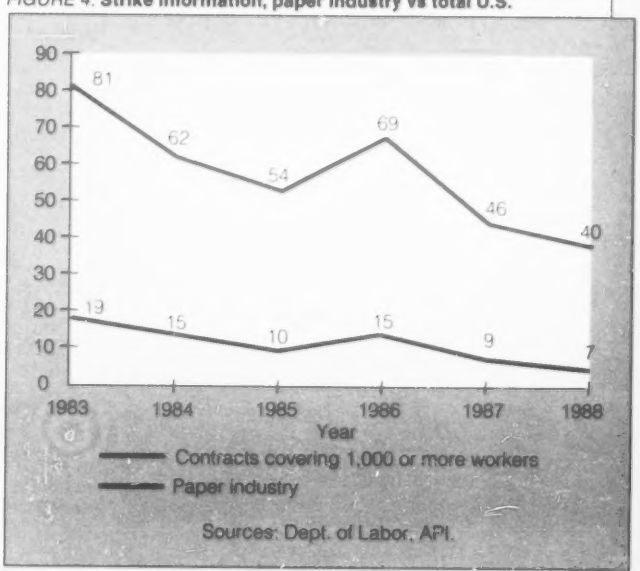
Source: American Paper Institute.

FIGURE 3: **Paper industry contract duration.**



Sources: API, Kien Associates Inc. Through July 11, 1989.

FIGURE 4: **Strike information, paper industry vs total U.S.**



Sources: Dept. of Labor, API.

than three years. By 1989, over 90% of the contracts were for three or more years, with over half of those for four or more years' duration.

STRIKES. The number of strikes has decreased dramatically, both in the paper industry and in the U.S. in general. As of mid-1989, only one strike has occurred, in contrast to 19 strikes five years ago (Figure 4). While 1989 is not yet over, it is apparent that the United Paperworkers International Union (UPIU) is reluctant to call strikes in the face of its experience with companies that have operated struck mills and successfully replaced workers who have struck.

In March 1989, when UPIU struck Little Rapids Paper Co., Potsdam, N.Y., the company completely and permanently replaced its striking workers within four weeks. While a strike is obviously still a weapon available to unions, its costliness and the ability of employers to respond quickly and dramatically must raise questions in the minds of union leaders about what other options they might take.

NEW UNION RESPONSES. Recently, UPIU has been using what it describes as a "pooled approach" to company bargaining. Specifically aimed at the large, integrated, multi-facility companies, pooling is designed to apply economic pressure on contract ratification by putting all facilities up for negotiation simultaneously. It is a legal way for the union to try to establish a form of multiple bargaining, without employer consent.

UPIU has indicated that this approach will be used in its bargaining with Champion International Corp. It has also attempted to use it with Stone Container Corp., International Paper Co., and others. Considering that the economic needs of each facility are varied, that often more than one union is involved at each mill, and that the National Labor Relations Board may reject the approach, I have to question whether or not this tactic will be an effective alternate weapon for the union.

EMPLOYEE INVOLVEMENT. Another major development of the past few years is a positive one. Companies are expanding employee involvement plans, including flexibility programs to enhance workers' abilities to perform many tasks after training and the development of workers' responsibility for managing their own work teams. These employee involvement efforts will be the most significant trend contributing to higher levels of performance for both the individual and the corporation in the future. ■

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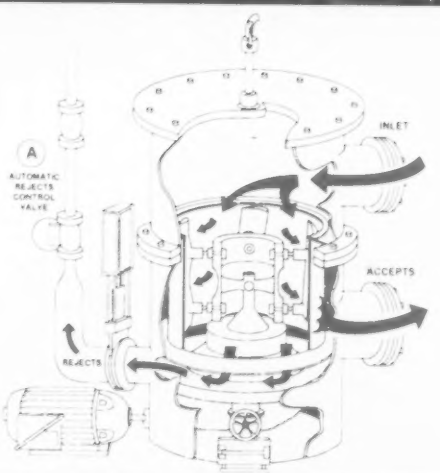

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